ORDER NO. AD8805042C2

Service Manual

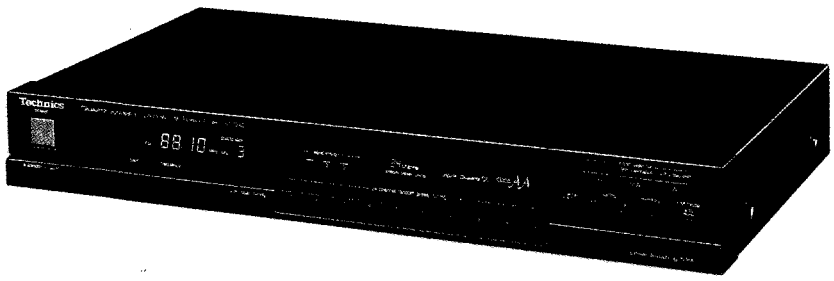
Tuner

QUARTZ Synthesizer LW/MW/FM Stereo Tuner

ST-G450L

Color

(K)...Black Type
(S)...Silver Type



Area

Color	Area
(K) (S)	(EK).....United Kingdom.
(K) (S)	(EB).....Belgium.
(K) (S)	(EF).....France.
(K) (S)	(EW).....Switzerland.

SPECIFICATIONS

(DIN 45 500)

■ FM TUNER SECTION

Frequency range	87.50~108.00MHz (50kHz-steps)
Sensitivity	1.5μV (IHF, usable)
S/N 30dB	1.3μV (75Ω)
S/N 26dB	1.2μV (75Ω)
S/N 20dB	0.9μV (75Ω)
IHF 46dB stereo quieting sensitivity	28μV/75Ω
Total harmonic distortion MONO	0.05%
STEREO	0.1%
S/N MONO	72dB (80dB, IHF)
STEREO	65dB (73dB, IHF)
Frequency response	4Hz~18kHz, +0.5dB~−1.5dB
Alternate channel selectivity	
normal ±400kHz	65dB
Capture ratio	1.0dB
Image rejection at 98MHz	55dB
IF rejection at 98MHz	90dB
Spurious response rejection at 98MHz	80dB
AM suppression	55dB
Stereo separation 1kHz	50dB
10kHz	40dB
Carrier leak 19kHz	−55dB (−60dB, IHF)
38kHz	−40dB (−45dB, IHF)
Channel balance (250Hz~6,300Hz)	±1.0dB
Limiting point	0.85μV
Bandwidth IF amplifier	180kHz
FM demodulator	1000kHz
Antenna terminals	75Ω (unbalanced)

■ AM TUNER SECTION

Frequency range	
MW	522kHz~1611kHz (9kHz-steps)
	530kHz~1620kHz (10kHz-steps)
LW	155kHz~353kHz (9kHz-steps)
	153kHz~351kHz (−2kHz shift)
Sensitivity (S/N 20dB) MW	20μV, 300μV/m
LW	50μV
Selectivity (±9kHz) MW (at 999kHz)	50dB
LW (at 254kHz)	50dB
Image rejection MW (at 999kHz)	40dB
LW (at 254kHz)	40dB
IF rejection MW (at 999kHz)	60dB
LW (at 254kHz)	35dB

■ GENERAL

Output voltage	0.3V (0.6V IHF)
Power consumption	9W
Power supply	
For United Kingdom	AC 50Hz/60Hz, 240V
For Continental Europe	AC 50Hz/60Hz, 220V
Dimensions (W×H×D)	430×64×241mm
	(16-15/16″×2-17/32″×9-1/2″)
Weight	2.2kg (4.84 lb.)

Notes:

1. Total harmonic distortion is measured by the digital spectrum analyzer (HP. 3045 system).
2. Specifications are subject to change without notice. Weight and dimensions are approximate.

Technics

Matsushita Electric Industrial Co., Ltd.
Central P.O. Box 288, Osaka 530-91, Japan

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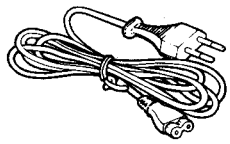
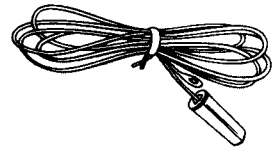
■ ACCESSORIES

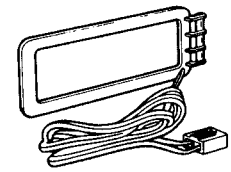
• AC power supply cord 1
(SFDAC05G02 [EK])
(SFDAC05E03 [EW, EF, EB])



• FM indoor antenna 1
(SSA270M)

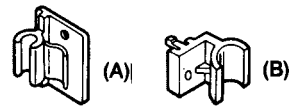


• AM loop antenna 1
(SPB1162T)



• Stereo connection cable 1
(SJP2249-1)

• AM antenna holders 2
(SMA233-1M) (SMA231M)



• Screws 2
(XTN3+10AFZ)

• Attachment plug 1
(For United Kingdom only)
(SJP9009)

ORDER NO. AD8805042C2-A

Tuner

ST-G450L

DEUTSCH

■ MESSUNGEN UND EINSTELL METHODEN

■ LW/MW/FM

Einstellungen der Bedienelemente und zu verwendende Geräte.

- MW und UKW Meßsender (MW und UKW Nebsender)
- Stereo-Modulator
- Verzerrungs-Analystator
- Elektronische Wechselstrom-und Gleichstrom-Voltmeter (EVM)
- Keramischer Kondensator (200pF)
- Oszilloskop
- Frequenzzähler
- Drosselspule (100μH)
- Widerstand (100KΩ)

Anmerkung: Für **T201** (AM ZFT), **L251** (LW-Antennenspule), werdeven justiert Ersatzteil geliefert. Dien Kern dieses Teils daher nicht drehen.

MW-HF-JUSTIERUNG

1. Der Testaufbau ist in der Abbildung gezeigt.
2. Stellen Sie die Einheit auf "**MW**" Betrieb.
3. Radio und Signalgenerator auf **612kHz** einstellen.
4. **L203** so justieren, daß die im Signalzustand gemessene Spannung **1.0V**.
5. **L202** auf maximale Ausgangsleistung adgleichen.
6. Radio und Signalgenerator auf **1503kHz** einstellen.
7. **CT201** auf maximale Ausgangsleistung abgleichen.
8. Die Schritte 3~7 wiederholen.

Anmerkung:
Der Antenneneingang-Signalpegel muß so niedrig wie möglich und frei von automatischer werstärkungsregelung (AGC) sein.

LW-HF-JUSTIERUNG

1. Der Testaufbau ist in der Abbildung gezeigt.
2. Stellen Sie die Einheit auf "**LW**" Betrieb.
3. Die Radiofrequenzanzeige und den Messender auf **155kHz** einstellen.
4. **L252** auf maximale Ausgangsleistung abgleichen.
5. Die Radiofrequenzanzeige und den Messender auf **353kHz** einstellen.
6. **CT251** auf maximale Ausgangsleistung abgleichen.
7. Die Schritte 3~6 wiederholen.

Anmerkung:
Der Antenneneingang-Signalpegel muß so niedrig wie möglich und frei von automatischer werstärkungsregelung (AGC) sein.

UKW-MONO-VERZERRUNGS-JUSTIERUNG

1. Der Testaufbau ist in der Abbildung gezeigt.
2. Stellen Sie die Einheit auf "**FM (UKW)**" Betrieb.
3. Die Radiofrequenzanzeige und den Messender auf **100.10MHz** einstellen.
4. Den Kern von **T101** so justieren, daß die im Signalzustand gemessene Spannung **0mV (0±10mV)** im 300mV-Bereich beträgt.
5. **T102** so justieren, daß der Verzerrungsfaktor des linken Kanals minimal wird.
6. Schritte 4 und 5 einige Male wiederholen.
7. Versichern Sie sich, daß die Verzerrungsfaktoren von Kanal L und Kanal R annähernd gleich sind und auf ein Minimum gehalten sind.

Anmerkung:
Für die Justierung ist ein Schraubendreher aus Kunststoff zu verwenden.

MPX-SGO-JUSTIERUNG

1. Der Testaufbau ist in der Abbildung gezeigt.
2. Den UKW-Bertriebsart-Wahlshalter in die "**on/auto**" Position stellen.
3. Radio und Meßsender auf **100.10MHz** einstellen.
4. **VR302** auf **19kHz±30Hz** auf der Frequenzzähleranzeige justieren.

• VERWENDUNG EINES ALTERNATIVSYSTEMS

1. Stereosignal vom Meßsender eingeben oder eine Stereo-Sendung empfangen.
2. **VR302** justieren, bis die Stereo-Anzeige aufleuchtet. Den Arm von **VR302** mit Lack sichern, wie in der Abbildung gezeigt.

38kHz-AUSBLENDKREISES-JUSTIERUNG

1. Der Testaufbau ist in der Abbildung gezeigt.
2. Stellen Sie die Einheit auf "**FM**" Betrieb.
3. Die Radiofrequenzanzeige und den Messender auf **100.10MHz** einstellen.
4. **VR303** auf minimal Ausgangsleistung abgleichen.

TRENNUNGS-JUSTIERUNG

1. Der Testaufbau ist in der Abbildung gezeigt.
2. Stellen Sie die Einheit auf "**FM**" Betrieb.
3. Die Radiofrequenzanzeige und den Messender auf **100,10MHz** einstellen.
4. **VR301** so justieren, daß der R-Ausgang minimal ist, wenn der Stereomodulator im L-Betriebszustand (Linker Kanal moduliert) ist.

D

FRANCAIS

■ MEAURAGES ET REGLAGES

■ LW/MW/M.F.

Positionnements des commandes et équipement utilisé

- Générateur de signaux AM et FM (AM et FM- SG)
- Modulateur stéréophonique
- Analyseur de distorsion
- Oscilloscope
- Compteur de fréquence
- Bobine d'amortissement d'arrêt (100μH)
- Résistance (100kΩ)
- Condensateur céramique (200pF)
- Voltmètre électronique à C.A. et C.C. (EVM).

Nota: Pour **T201** (A.M.) F.I., **L251** (bobine ANT LW), des éléments réglés sont fournis. Aussi, ne pas tourner les noyaux de ces pièces.

REGLAGE DE A.M.-H.F.

1. Le raccordement de l'équipement d'essai est montré sur l'illustration.
2. Régler l'appareil sur le mode "**MW**".
3. Régler le cadran radio et le générateur de signaux sur **612kHz.**
4. Ajuster **L203** de telle sorte que la tension mesurée sur le mode de signaux soit de **1.0V.**
5. Régler **L202** pour une sortie maximale.
6. Régler le cadran radio et le générateur de signaux sur **1503kHz.**
7. Régler **CT201** pour une sortie maximale.
8. Répéter les étapes 3~7.

Nota:
Le niveau d'entrée d'antenne doit être aussi bas que possible étant libéré de commande automatique de gain.

REGLAGE DE RE-LW

1. Le raccordement de l'équipement d'essai est montré sur l'illustration.
2. Régler l'appareil sur le mode "**LW**".
3. Régler le réglage de l'affichage de radiofréquence et du générateur de signaux sur **612kHz.**
4. Ajuster **L252** pour une sortie maximale.
5. Ajuster le réglage de l'affichage de radiofréquence et du générateur de signaux sur **353kHz.**
6. Régler **CT251** pour une sortie maximale.
7. Répéter les étapes 3~6.

Nota:
Le niveau d entrée d'antenne doit étre aussi bas que possible étant libéré de la commande automatique de gain.

REGLAGE DE DISTORSION MONOPHONIQUE M.F.

1. Le raccordement de l'équipement d'essai est montré sur l'illustration.
2. Régler l'appareil sur le mode "**FM**".
3. Régler le réglage de l'affichage de radiofréquence et du générateur de signaux sur **100.10MHz.**
4. Ajuster le noyau de **T101** de telle sorte que la tension mesurée sur le mode de signaux soit de **0mV (0±10mV)** dans une plage de 300mV.
5. Ajuster **T102** de telle que le facteur de sistorsion du canal de gauche soit minimisé.
6. Répéter les étapes 4 et 5 quelques fois.
7. S'assurer que les facteurs de distorsion du canal de gauche et du canal droite soient sensiblement les mêmes et au minimum.

Nota:
Le tournevis de réglage utilisé devra être fait en résines.

REGLAGE MULTIPLEX DE L'OSCILLATEUR COMMANDE PAR VARIATION DE TENSION

1. Le raccordement de l'équipement d'essai est montré sur la figure.
2. Régler l'appareil sur la position "**on/auto**".
3. Régler le cadran radio et le générateur de signaux sur **100.10MHz.**
4. Ajuster **VR302** pour **19kHz±30Hz** sur le compteur de lecture de fréquences.

•EN UTILISANT UN SYSTEME ALTERNATIF

1. Applique un signal stéréo à partir du générateur ou recevoir une émission stéréo.
2. Ajuster **VR302** jusqu' à ce que l'indicateur stéréo séclaire. Coller le bras de **VR302** comme il montré sur la figure.

REGLAGE DU CIRCUIT DE SUPPRESSION 38kHz

1. Le raccordment de l'équipement d'essai est montré sur la figure.
2. Régler l'appareil sur le mode "**FM**".
3. Régler le cadran radio et le générateur de signaux sur **100.10MHz.**
4. Ajuster **VR303** pour une sortie minimum.

REGLAGE DE SEPARATION

1. Le raccordement de l'équipement d'essai est montré sur l'illustration.
2. Régler l'appareil sur le mode "**FM**".
3. Ajuster le réglage de l'affichage de radioféquence et du générateur de signaux sur **100,10MHz.**
4. Ajuster **VR301** de telle sorte que la sortie de droite soite minimisée lorsque le modulateur stéréo est sur le mode "**G**". (modulation de canal de gauche.)

D

ESPAÑOL

■ MEDICIONES Y AJUSTES

■ LW/MW/FM

Posiciones de control y equipo usado.

- Generador de señales de AM y FM (AM y FM- SG)
- Voltimetro electrónico de CA y CC (EVM)
- Analizador de distorsiones
- Osciloscopio
- Frecuencimetro
- Frecuencimetro
- Bobina de choque (100μH)
- Resistor (100kΩ)
- Condensador cerámico (200pF)

Nota: Para **T201** (MW-IFT), **L251** (bobina antena LO), son suministradas piezas ajustadas. Por lo tanto, no gire los núcleos de estas piezas.

AJUSTE DE MW-RF

1. La conexión del equipo de pruebas se muestra en la figura.
2. Poner la unidad en modalidad de "**AM**".
3. Poner la presentación de la radio y el generador de señales en **612kHz.**
4. Ajustar **L203** de manera que el voltaje medido en modalidad de señal sea **1.0V.**
5. Ajustar **L202** para salida màxima.
6. Poner la presentación de la radio y el generador de señales en **1503kHz.**
7. Ajustar **CT201** para salida màxima.
8. Repita los pasos 3. al 7.

Nota:
El nivel de entrada de antena ha de ser lo màs bajo posible estando libre de AGC (control automàtico de ganancia).

AJUSTE DE LO-RF

1. La conexión del equipo de pruebas se muestra en la figura.
2. Poner la unidad en modalidad de "**LW**".
3. Poner la puesta de la presentación de radiofrecuencia y generador de señales a **155kHz.**
4. Ajustar **L252** para salida màxima.
5. Poner la puesta de la presentación de radiofrecuencia y generador de señales a **353kHz.**
6. Ajustar **CT251** para salida màxima.
7. Repitir los pasos 3. al 6.

Nota:
El nivel de entrada de antena ha de ser lo màs bajo posible estando libre de AGC (control automàtico de ganancia).

AJUSTE DE DISTORSION MONO FM

1. La conexión del equipo de pruebas se muestra en la figura.
2. Poner la unidad en modalidad de "**FM**".
3. Poner la puesta da la presentación de radiofrecuencia y generador de señales a **100,10MHz.**
4. Ajustar el núcleo de **T101** de manera que el voltaje medido en modalidad de señal sea **0mV (0±10mV).**
5. Ajustar **T102** de manera que el factor de distorsión de CH-I se minimice.
6. Repetir los pasos 4 y 5 algunas veces.
7. Asegurarse de que los factores de distorsión de CH-I y CH-D sean casi los mismos y los minimos.

Nota:
El destornillador de ajuste usado debe estar hecho de resina.

AJUSTE DE MPX VCO (OSCILADOR CONTROLADO POR VOLTAJE MPX)

1. La conexión del equipo de pruebas se muestra en la figura.
2. Poner la unidad en la posición de "**on/auto**".
3. Poner la presentación de la radio y la puesta del generador de señales en **100,10MHz.**
4. Ajustar **VR302** para **19kHz±30Hz** en lectura de frecuencimetro.

• USANDO SISTEMA ALTERNATIVO

1. Aplicar señal estereofónica del generador o recibir la emisión estereofónica.
2. Ajustar **VR302** hasta que la presentacón de estéro se encienda. Fijar el brazo de **VR302** como se muestra en la figura.

AJUSTE DE CIRCUITO DE CANCELACION, 38kHz

1. La conexión del equipo de pruebas se muestra en la figura.
2. Poner la unidad en modalidad de "**FM**".
3. Poner la puesta da la presentación de radiofrecuencia y generador de señales a **100,10MHz.**
4. Ajustar **VR303** para salida minimos.

AJUSTE DE SEPARACION

1. La conexión del equipo pruebas se muestra en la figura.
2. Poner la unidad en modalidad de "**FM**".
3. Poner la puesta de la presentación de radiofrecuencia y generador de señales a **100,10MHz.**
4. Ajustar **VR301** de manera que la salida de D quede minimizada cuando el modulador de estéreo esté en la modalidad "I". (modulación de CH-I.)

Printed in Japan
H880501000 YY/TN D

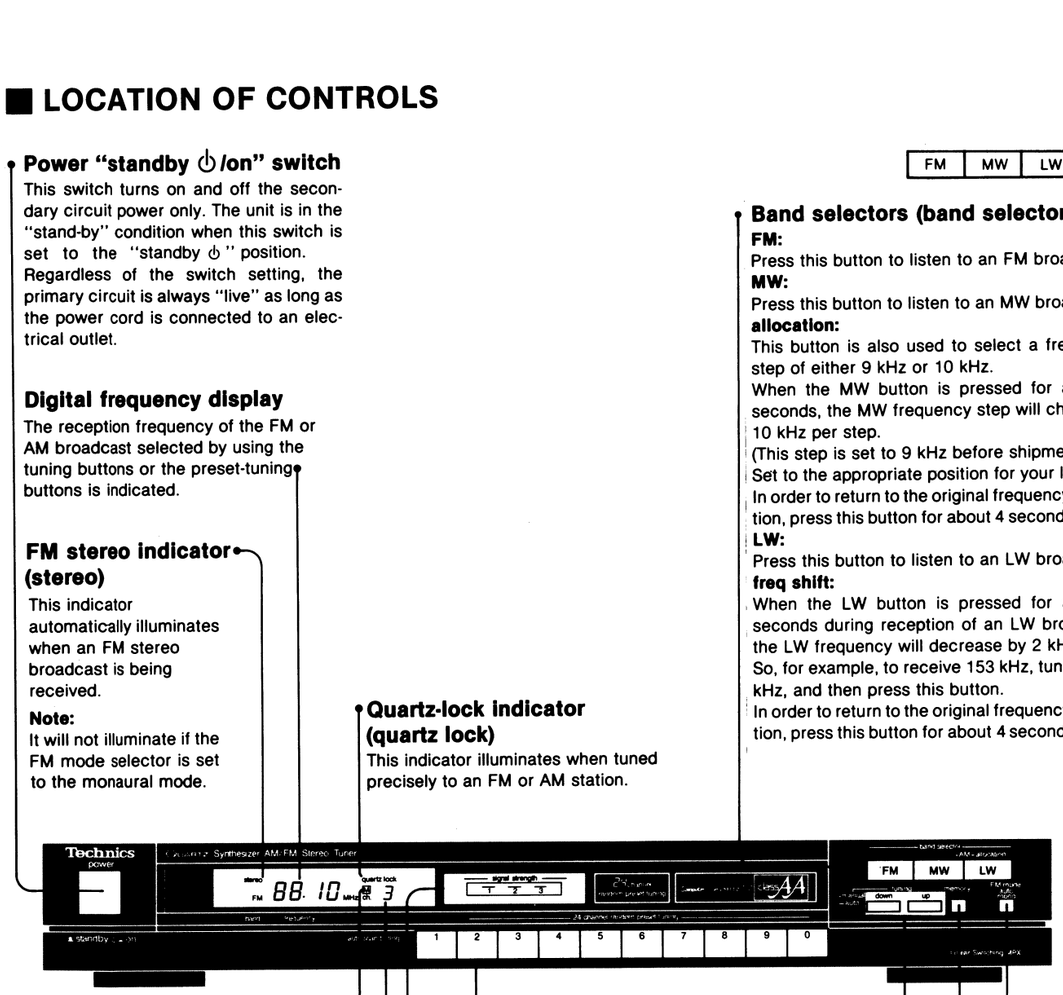
■ LOCATION OF CONTROLS

• Power "standby ⏻/on" switch
This switch turns on and off the secondary circuit power only. The unit is in the "stand-by" condition when this switch is set to the "standby ⏻" position.
Regardless of the switch setting, the primary circuit is always "live" as long as the power cord is connected to an electrical outlet.

Digital frequency display
The reception frequency of the FM or AM broadcast selected by using the tuning buttons or the preset-tuning buttons is indicated.

FM stereo indicator (stereo)
This indicator automatically illuminates when an FM stereo broadcast is being received.
Note:
It will not illuminate if the FM mode selector is set to the monaural mode.

Quartz-lock indicator (quartz lock)
This indicator illuminates when tuned precisely to an FM or AM station.



Memory indicator (M)
This indicator illuminates when the memory button is pressed.

Channel display
The channel number selected by the preset-tuning buttons is displayed.

Signal-strength indicators (signal strength)
These indicators show the relative strength of broadcast signals being received by the antenna. The best condition for reception, for FM and AM, is when the indicators illuminate completely to the top.

Preset-tuning buttons (1~0) (24 channel random preset tuning)
These buttons are used to preset FM and AM broadcast frequencies into the memory of this unit, and are also pressed to select the desired preset frequencies.

FM	MW	LW

Band selectors (band selector)
FM:
Press this button to listen to an FM broadcast.
MW:
Press this button to listen to an MW broadcast.
allocation:
This button is also used to select a frequency step of either 9 kHz or 10 kHz.
When the MW button is pressed for about 4 seconds, the MW frequency step will change to 10 kHz per step.
(This step is set to 9 kHz before shipment.)
Set to the appropriate position for your locality.
In order to return to the original frequency indication, press this button for about 4 seconds again.
LW:
Press this button to listen to an LW broadcast.
freq shift:
When the LW button is pressed for about 4 seconds during reception of an LW broadcast, the LW frequency will decrease by 2 kHz.
So, for example, to receive 153 kHz, tune to 155 kHz, and then press this button.
In order to return to the original frequency indication, press this button for about 4 seconds again.

Tuning buttons (tuning)
These buttons are used for tuning to the desired broadcast station.

Memory button (memory)
This button is used when preset memory setting of the preset-tuning buttons is made.

FM mode selector (FM mode)
This unit automatically switches to the stereo mode when a stereo broadcast is received. Press this selector to listen in the monaural mode. The FM stereo indicator will not illuminate in the monaural mode.

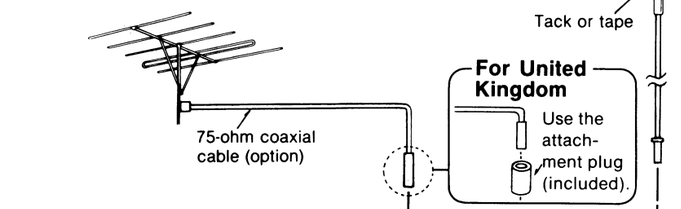
■ CONNECTIONS

The indication AM used here includes both MW and LW for model ST-G450L.

Note: An outdoor antenna should be installed by a competent technician only.

FM outdoor antenna (option)

(Necessary in mountainous regions, inside reinforced-concrete buildings, etc.)

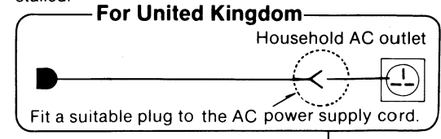


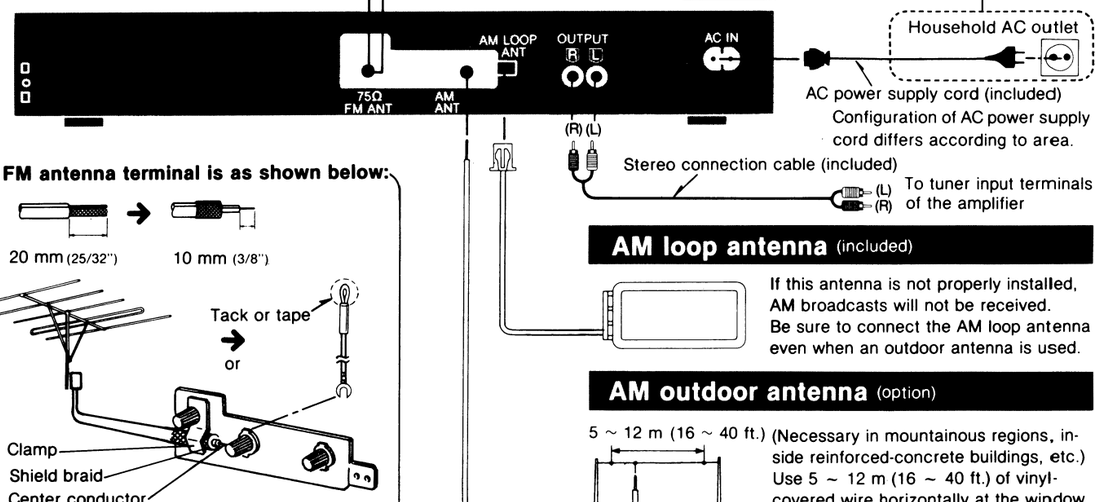
If FM antenna terminal is as shown below:

Be sure the shield braid contacts the clamp.

FM indoor antenna (included)

- Attach to a wall (using tack or tape) facing in direction of best reception.
- Tack should not contact internal antenna wire.
- For best reception sound quality, an FM outdoor antenna is recommended.
- Disconnect this antenna if an FM outdoor antenna is installed.

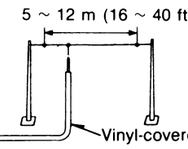




AM loop antenna (included)

If this antenna is not properly installed, AM broadcasts will not be received.
Be sure to connect the AM loop antenna even when an outdoor antenna is used.

AM outdoor antenna (option)

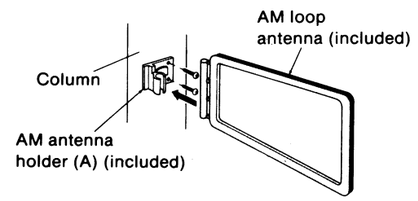


(Necessary in mountainous regions, inside reinforced-concrete buildings, etc.)
Use 5 ~ 12 m (16 ~ 40 ft.) of vinyl-covered wire horizontally at the window.

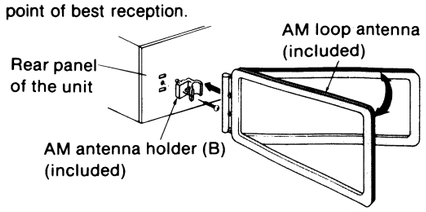
Installation of the AM loop antenna

1. Pay attention to the following points when attaching the antenna.
   - Do not attach it horizontally (to do so would impair reception).
   - Do not attach it close to metal surfaces (to do so would result in noise).
   - Do not attach it close to power cords, speaker wires, etc. (to do so would result in noise).
   - Do not attach it close to a tape deck (when the tape deck is being used, chirping or beeping sounds may be received).
2. Connect the AM loop antenna to the AM antenna terminals located on the rear panel of the unit.

When attaching the antenna to a wall, column or rack
Find the height and direction of the antenna where reception is best and then fix it vertically to the wall, rack, etc.

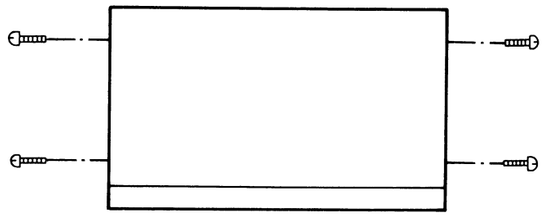


When attaching the antenna to the unit
This type of installation may cause impaired reception or result in signal noise. If possible, attach the antenna to the rack, a wall, or a column.
Move the antenna toward the right or left to find the point of best reception.

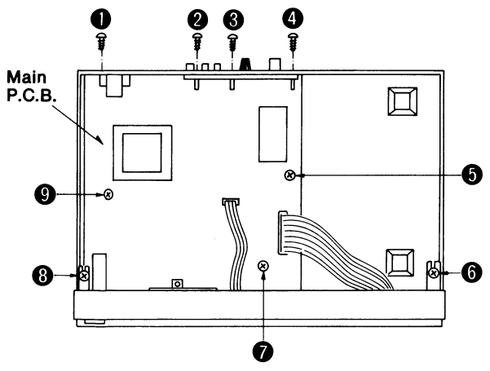


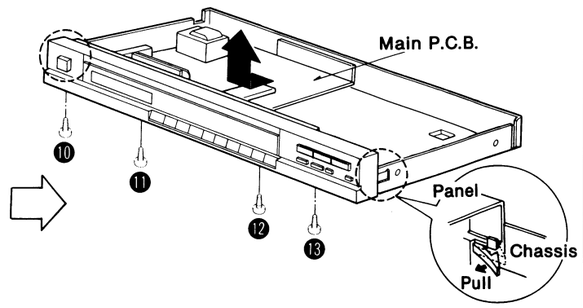
■ DISASSEMBLY INSTRUCTIONS

Ref. No. 1	How to remove the cabinet
Procedure 1	• Remove the 4 screws.

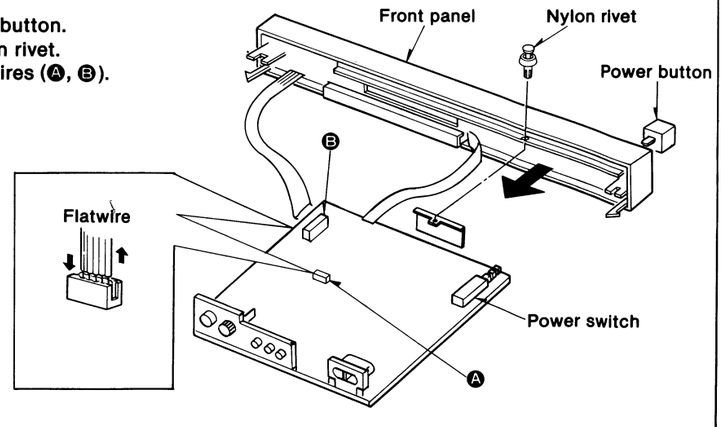


Ref. No. 2	How to remove the main P.C.B.
Procedure 1→2	• Remove the 9 screws (❶~❾). • Remove the 4 screws (❿~⓭). • Slightly pull the front panel toward you and remove the main P.C.B.

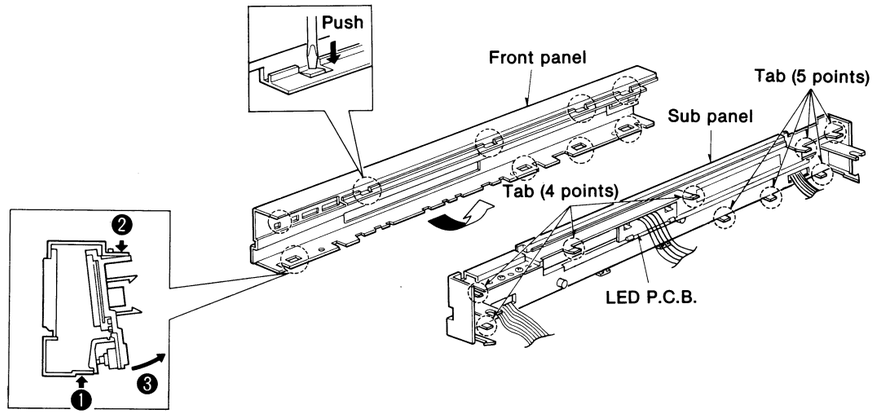




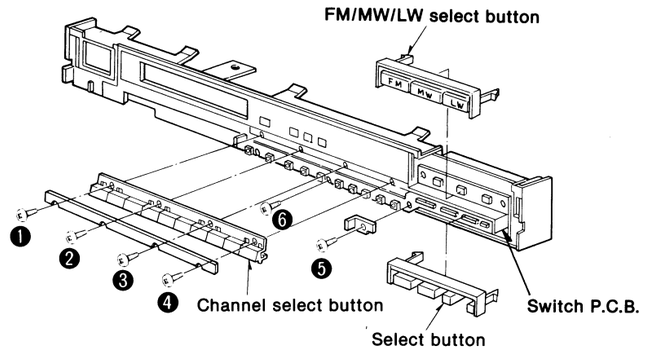
Ref. No. 3	How to remove the front panel
Procedure 1→2→3	• Remove the power button. • Remove the 1 Nylon rivet. • Remove the 2 flatwires (Ⓐ, Ⓑ).



Ref. No. 4	How to remove the sub panel
Procedure 1→2→3→4	• Push out the 9 tabs on the bottom and top side of the sub panel by used minusdriver.



Ref. No. 5	How to remove the switch P.C.B.
Procedure 1→2→3→4→5	• Remove the 6 screws (❶~❻).



■ MEASUREMENTS AND ADJUSTMENTS

■ LW/MW/FM

Control positions and equipment used

- AM and FM signal generator(AM and FM-SG)
- Stereo modulator
- Distortion analyser
- Oscilloscope
- Frequency counter
- Choke coil (100μH)
- Resistor(100kΩ)
- Ceramic capacitor(200pF)
- AC and DC electronic voltmeter(EVM)

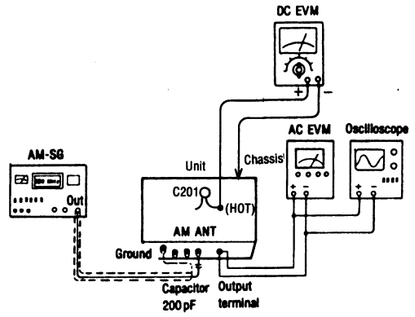
Note: For **T201** (MW-IFT), **L251** (LW ANT coil), they are supplied as adjusted parts. So, do not turn the cores of the parts.

MW-RF ADJUSTMENT

1. Test equipment connection is shown in figure.
2. Set the unit to "**MW**" mode.
3. Set the radio frequency display and signal generator to **612kHz**.
4. Adjust **L203** so that the voltage measured in signal mode is **1.0V**.
5. Adjust **L202** for maximum output.
6. Set the radio frequency display and signal generator to **1503kHz**.
7. Adjust **CT201** for maximum output.
8. Repeat steps 3~7.

Note: Antenna input level must be as low as possible being free from AGC.

AM SIGNAL GENERATOR CONDITION
Modulation 30%
Modulation frequency 400Hz

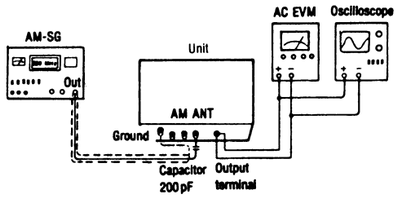


LW-RF ADJUSTMENT

1. Test equipment connection is shown in figure.
2. Set the unit to "**LW**" mode.
3. Set the radio frequency display and signal generator to **155kHz**.
4. Adjust **L252** for maximum output.
5. Set the radio frequency display and signal generator to **353kHz**.
6. Adjust **CT251** for maximum output.
7. Repeat steps 3 ~ 6.

Note: Antenna input level must be as low as possible being free from AGC.

AM SIGNAL GENERATOR CONDITION
Modulation 30%
Modulation frequency 400Hz

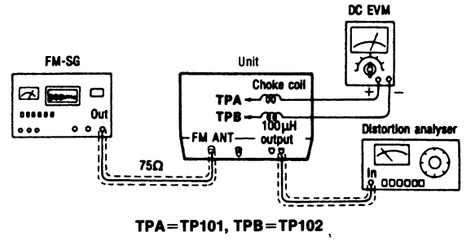


FM MONO DISTORTION ADJUSTMENT

1. Test equipment connection is shown in figure.
2. Set the unit to "**FM**" mode.
3. Set the radio frequency display and signal generator to **100.10MHz**.
4. Adjust the core of **T101** so that the voltage measured in signal mode is **0mV(0±10mV)** in 300mV range.
5. Adjust **T102** so that the distortion factor of L-CH is minimized.
6. Repeat steps 4 and 5.
7. Make sure that the distortion factors of L-CH and R-CH are nearly the same and minimum.

Note: The adjusting screwdriver used should be made of resin.

FM SIGNAL GENERATOR CONDITION
Modulation 100%
Modulation frequency 1kHz
Output level.....66dB



TPA=TP101, TPB=TP102

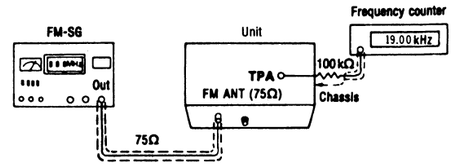
MPX VCO ADJUSTMENT

1. Test equipment connection is shown in figure.
2. Set the unit to **"on/auto"** position.
3. Set the radio frequency display and signal genarator to **100.10MHz**.
4. Adjust **VR302** for **19kHz±30Hz** on frequency counter reading.

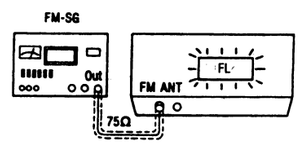
•USING ALTERNATE SYSTEM

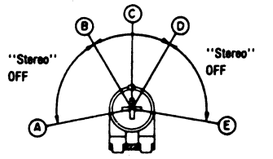
1. Apply stereo signal from generator or receive the stereo broadcast.
2. Adjust **VR302** until stereo indicator lights up. Fix the arm of **VR302** as shown in figure.

FM SIGNAL GENERATOR CONDITION
Modulation 0%
Modulation frequency 0
Output level.....66dB



TPA = TP301, Frequency counter:19.00 kHz





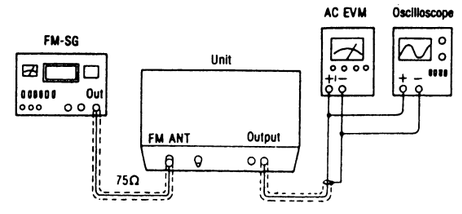
VR302

Ⓐ−Ⓑ,
Ⓓ−Ⓔ..... **"Stereo" OFF position**
Ⓑ−Ⓓ..... **"Stereo" ON position (Indicator lighting)**
Ⓒ..... **Adjust point of pilot circuit**

38kHz CANCEL CIRCUIT ADJUSTMENT

1. Test equipment connection is shown in figure.
2. Set the unit to "**FM**" position.
3. Set the radio frequency display and signal generator to **100.10MHz**.
4. Adjust **VR303** so that the output is minimized.

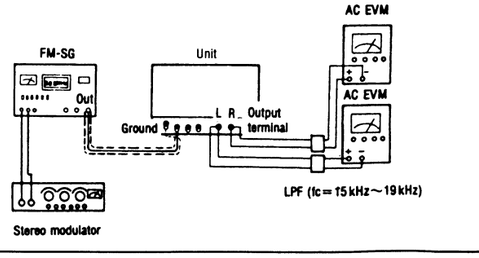
FM SIGNAL GENERATOR CONDITION
Modulation.....Stereo "L+R" mode 0%, Pilot 10%
Modulation frequency.....1kHz (Pilot 19kHz)
Output level.....66dB



SEPARATION ADJUSTMENT

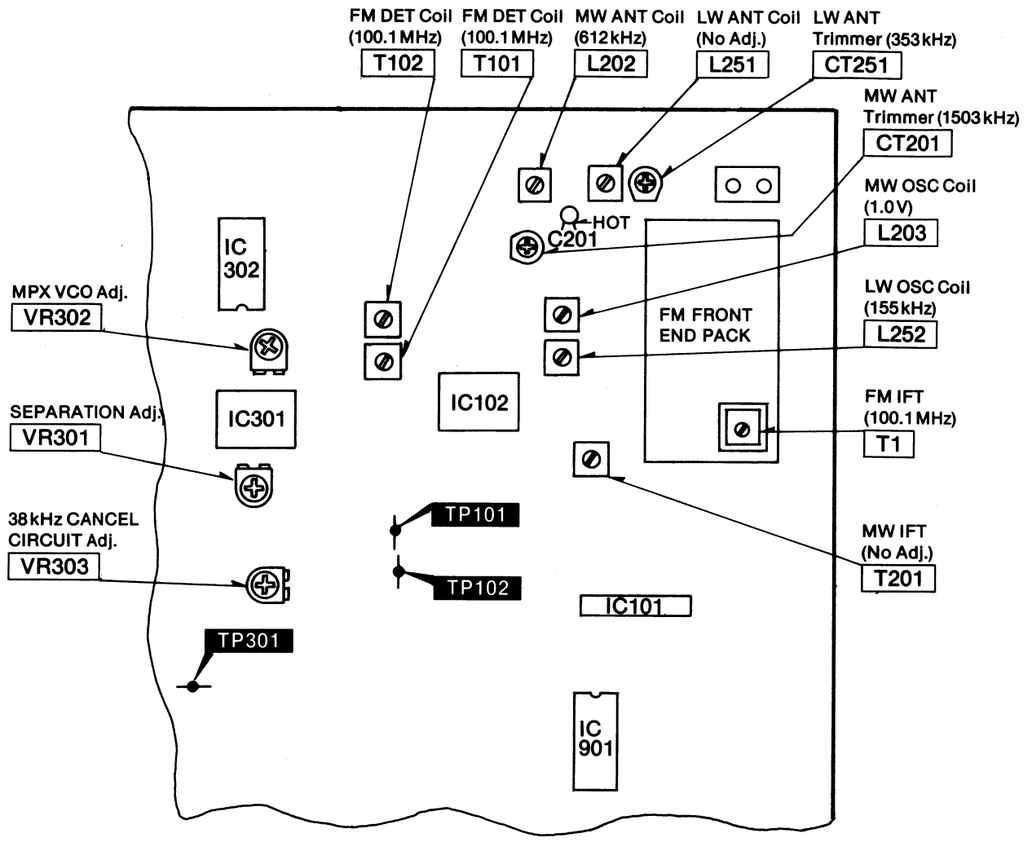
1. Test equipment connection is shown in figure.
2. Set the unit to **"FM"** mode.
3. Set the radio frequency display and signal generator to **100.10MHz**.
4. Adjust **VR301** so that the R-CH output is minimized when stereo modulator is in "L"(L-CH modulation) mode.

FM SIGNAL GENERATOR CONDITION
Modulation.....Stereo "L" mode or "R" mode 45%, Pilot 10%
Modulation frequency .....1kHz(Pilot 19kHz)
Output level 66dB



D

• **Adjustment points**



■ FUNCTION OF TERMINAL

• **IC902 (LC6512A3377) PLL Controller**

PIN NO.	IN/OUT	MARK	DESCRIPTION OF TERMINAL
1	I	PB3	Computer drive terminal.
2	O	DATA	Serial data output terminal.
3	O	CL	Clock signal terminal for serial data.
4	O	CE	Chip enable terminal.
5	—	PC3	Not used in this unit.
6	—	NC	Not used in this unit.
7	O	PD0	Auto/mono changeover terminal. (auto → 0V, mono → 5V)
8	—	PD1	Not used in this unit.
9		PD2	
10		PD3	
11		PE0	
12 ∫ 14 • 22 ∫ 25	O	PE1 ∫ PE3 • PF0 ∫ PF3	Digital signal terminal for display. Terminal for key return signal to external key matrix.
15	I	$\overline{RES}$	Reset terminal.
16	—	TEST	Ground terminal.
17		V_{SS}	
18	—	NC	Not used in this unit.
19			
20	I	OSC1	Connecting terminal for crystal oscillator.
21	O	OSC2	
26 ∫ 29 • 31 ∫ 34	O	PG0 ∫ PG3 • PH0 ∫ PH3	Segment signal terminal for display.
30	—	NC	Not used in this unit.
35	O	P10	Not used in this unit.
36	O	P11	Muting signal terminal. (Muting → High level)
37	I	$\overline{HOLD}$	Terminal for power failure detection.
38	I	$\overline{INT}$	Terminal for remote control cord.
39	I	V_{DD}	Power supply terminal of device. Voltage of 5V is supplied during operation of device.
40	I	PA0 ∫ PA3	Terminal for key return signal to external key matrix.
41			
44			
45			
42 • 43	—	NC	Not used in this unit.
46	I	PB0 ∫ PB2	Stereo signal terminal.
47			SD signal terminal.
48			Tuner select terminal. (Ground connection)

[KEY MATRIX]

Pin No.	45	44	41	40
14	CH4	CH3	CH2	CH1
22	CH8	CH7	CH6	CH5
23	—	—	CH0	CH9
24	—	LW	MW	FM
25	MODE	MEMORY	UP	DOWN

■ RESISTORS & CAPACITORS

Notes : * Important safety notice :
Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.
* Bracketed indications in Ref. No. columns specify the area. (Refer to the first page for area.)
Parts without these indications can be used for all areas.

Numbering System of Resistor

Example:

ERD	25	F	J	102
Type	Wattage (1/4W)	Shape	Tolerance	Value (1KΩ)
ERX	2	AN	J	471
Type	Wattage (2W)	Shape	Tolerance	Value (470Ω)

Numbering System of Capacitor

Example:

ECKD	1H	102	Z	F
Type	Voltage (50V)	Value (0.001μF)	Tolerance	Peculiarity
ECEA	50	M	330	
Type	Voltage (50V)	Pecliarity	Value (33μF)	

● Capacity are in microfarads (μF) unless specified otherwise, P = Pico-farads (pF) F = Farads (F).
● Resistance are in ohms (Ω), unless specified otherwise, 1K = 1,000Ω, 1M = 1,000kΩ

Resistor Type		Wattage		Tolerance
ERD	: Carbon	10 : 1/8W	12 : 1/2W	J : ±5%
ERG	: Metal Oxide	14 : 1/4W	25 : 1/4W	F : ±1%
ERQ	: Fuse Type Metal	1A : 1W	18 : 1/8W	G : ±2%
ERX	: Metal Film	S2 : 1/4W	S1 : 1/2W	J : ±5%
ERD L	: Carbon (chip)	2F : 1/4W	50 : 1/2W	K : ±10%
ERO K	: Metal Film (chip)	2A : 2W	3A : 3W	M : ±20%
ERC	: Solid	6G : 1/10W	8G : 1/8W	
ERF	: Incombustible Box-Shaped			
ERM	: Wire-Wound			
RRJ	: Cip Resistor			
ERJ	: Cip Resistor			

Capacitor Type		Voltage		Tolerance
ECE	: Electrolytic	0J : 6.3V	1A : 10V	K : ±10%
ECCD	: Ceramic	1C : 16V	1E : 25V	M : ±20%
ECKD	: Ceramic Capacitor	1H : 50V	1V : 35V	Z : +80 −20 %
ECQM	: Poyester	50 : 50V	05 : 50V	J : ±5%
ECQP	: Polypropylene	2H : 500V	2A : 100V	G : ±2%
ECG	: Ceramic	1 : 100V	1J : 63V	F : ±1%
ECEA N	: Non Polar Electrolytic	KC : 400V AC		C : ±0.25pF
QCU	: Ceramic (Chip Type)	KC : 125V AC (UL)		D : ±0.5pF
ECUX	: Ceramic (Chip Type)			
ECF	: Semiconductor			
EECW	: Liquid electrolyte double layer capacitor			

Ref. No.	Part No.	Value.
RESISTORS(VALUE,WATTAGE)		
R1	ERDS2TJ104	100K 1/4
R2	ERDS2TJ273	27K 1/4
R101	ERDS2TJ331	330 1/4
R102	ERDS2TJ102	1K 1/4
R103	ERDS2TJ331	330 1/4
R104	ERDS2TJ331	330 1/4
R105	ERDS2TJ102	1K 1/4
R106	ERDS2TJ392	3.9K 1/4
R107	ERDS2TJ221	220 1/4
R108	ERDS2TJ104	100K 1/4
R109	ERDS2TJ101	100 1/4
R110	ERDS2TJ822	8.2K 1/4
R111	ERDS2TJ684	680K 1/4
R112	ERDS2TJ333	33K 1/4
R113	ERDS2TJ182	1.8K 1/4
R114	ERDS2TJ101	100 1/4
R126	ERDS2TJ101	100 1/4
R201	ERDS2TJ473	47K 1/4
R202	ERDS2TJ822	8.2K 1/4
R203	ERDS2TJ104	100K 1/4
R204	ERDS2TJ102	1K 1/4
R205	ERDS2TJ222	2.2K 1/4
R206	ERDS2TJ473	47K 1/4
R207	ERDS2TJ563	56K 1/4
R208	ERDS2TJ104	100K 1/4
R209	ERDS2TJ224	220K 1/4
R210	ERDS2TJ222	2.2K 1/4
R211	ERDS2TJ101	100 1/4
R212	ERDS2TJ473	47K 1/4
R213	ERDS2TJ273	27K 1/4
R214	ERDS2TJ473	47K 1/4
R215	ERDS2TJ101	100 1/4
R251	ERDS2TJ103	10K 1/4
R252	ERDS2TJ182	1.8K 1/4
R253	ERDS2TJ223	22K 1/4
R254	ERDS2TJ182	1.8K 1/4
R255	ERDS2TJ473	47K 1/4
R301	ERDS2TJ683	68K 1/4
R302	ERDS2TJ393	39K 1/4
R303	ERDS2TJ334	330K 1/4
R305	ERDS2TJ104	100K 1/4
R306	ERDS2TJ104	100K 1/4
R307	ERDS2TJ274	270K 1/4
R308	ERDS2TJ274	270K 1/4
R309	ERDS2TJ274	270K 1/4
R310	ERDS2TJ102	1K 1/4
R311	ERDS2TJ123	12K 1/4
R312	ERDS2TJ393	39K 1/4
R313	ERDS2TJ393	39K 1/4
R315	ERDS2TJ332	3.3K 1/4
R316	ERDS2TJ332	3.3K 1/4
R317	ERDS2TJ223	22K 1/4
R318	ERDS2TJ223	22K 1/4
R319	ERDS2TJ101	100 1/4
R320	ERDS2TJ101	100 1/4
R321	ERDS2TJ331	330 1/4
R322	ERDS2TJ331	330 1/4
R323	ERDS2TJ332	3.3K 1/4
R324	ERDS2TJ332	3.3K 1/4
R325	ERDS2TJ102	1K 1/4
R326	ERDS2TJ102	1K 1/4
R327	ERDS2TJ332	3.3K 1/4
R328	ERDS2TJ332	3.3K 1/4
R329	ERDS2TJ104	100K 1/4
R330	ERDS2TJ104	100K 1/4
R331	ERDS2TJ333	33K 1/4
R332	ERDS2TJ102	1K 1/4
R333	ERDS2TJ392	3.9K 1/4
R334	ERDS2TJ561	560 1/4
R340	ERDS2TJ333	33K 1/4
R401	ERDS2TJ182	1.8K 1/4
R402	ERDS2TJ392	3.9K 1/4
R403	ERDS2TJ331	330 1/4
R404	ERDS2TJ101	100 1/4
R405	ERDS2TJ151	150 1/4
R406	ERDS2TJ330	33 1/4
R407	ERDS2TJ331	330 1/4
R408	ERDS2TJ561	560 1/4
R701	ERDS2TJ102	1K 1/4
R702	ERDS2TJ221	220 1/4
R703	ERDS2TJ222	2.2K 1/4
R704	ERDS2TJ101	100 1/4
R705	ERDS2TJ101	100 1/4
R706	ERDS2TJ101	100 1/4
R707	ERDS2TJ473	47K 1/4
R708	ERDS2TJ103	10K 1/4
R709	ERDS2TJ103	10K 1/4
R710	ERC12ZGK335	3.3M 1/2
R901	ERDS2TJ102	1K 1/4
R902	ERDS2TJ273	27K 1/4
R903	ERDS2TJ682	6.8K 1/4
R904	ERDS2TJ561	560 1/4
R905	ERDS2TJ123	12K 1/4
R906	ERDS2TJ102	1K 1/4
R907	ERDS2TJ332	3.3K 1/4
R908	ERDS2TJ102	1K 1/4
R909	ERDS2TJ103	10K 1/4
R910	ERDS2TJ224	220K 1/4
R911	ERDS2TJ104	100K 1/4
R913	ERDS2TJ104	100K 1/4
R914	ERDS2TJ104	100K 1/4
R915	ERDS2TJ104	100K 1/4
R916	ERDS2TJ104	100K 1/4
R917	ERDS2TJ274	270K 1/4
R918	ERDS2TJ104	100K 1/4
R919	ERDS2TJ563	56K 1/4
R920	ERDS2TJ563	56K 1/4
R921	ERDS2TJ563	56K 1/4
R922	ERDS2TJ563	56K 1/4
R923	ERDS2TJ563	56K 1/4
R924	ERDS2TJ102	1K 1/4
R925	ERDS2TJ473	47K 1/4
R951	ERDS2TJ102	1K 1/4
R952	ERDS2TJ332	3.3K 1/4
R953	ERDS2TJ123	12K 1/4
CAPACITORS(VALUE,VOLTAGE)		
C1	ECEA1VK3R3	3.3 35
C3	ECKD1H103PF	0.01 50
C4	ECEA1CKS100	10 16
C101	ECKD1H103PF	0.01 50
C102	ECKD1H103PF	0.01 50
C103	ECKD1H103PF	0.01 50
C104	ECKD1H103PF	0.01 50
C105	ECQM1H223JZ	0.022 50
C106	ECEA0JU471	470 6.3
C107	ECQM1H102JZ	0.001 50
C108	RCBS1H180JCY	18P 50
C109	ECQM1H102JZ	0.001 50
C110	ECKD1H103PF	0.01 50
C111	ECKD1H103PF	0.01 50
C112	ECCD1H070CC	7P 50
C113	ECQM1H223JZ	0.022 50
C114	ECEA0JU101	100 6.3
C115	ECFTD104KXL	0.1 25
C116	ECEA0JU101	100 6.3
C117	ECEA1HKR22	0.22 50
C118	RCBC1H101KBY	100P 50
C119	ECKD1H103PF	0.01 50
C120	ECKD1H103PF	0.01 50
C121	ECKD1H473ZF	0.047 50
C201	ECKD1H473ZF	0.047 50
C202	RCBS1H180JCY	18P 50
C203	ECQP1471JZ	470P 125
C204	ECKD1H223PF	0.022 50
C205	ECKD1H103PF	0.01 50
C206	ECCD1H080CC	8P 50
C207	RCBC1H680JLY	68P 50
C208	ECKD1H103PF	0.01 50
C209	ECKD1H103PF	0.01 50
C210	ECEA0JK330	33 6.3
C211	ECKD1H103PF	0.01 50
C212	ECEA1HKR47	0.47 50
C213	ECEA0JK330	33 6.3
C214	ECKD1H223PF	0.022 50
C215	ECFTD183KXL	0.018 25
C216	ECKD1H103PF	0.01 50
C251	ECQP1391JZ	390P 100
C301	ECQM1H332JZ	0.0033 50
C302	ECKD1H103PF	0.01 50
C303	ECEA1AU101	100 10
C304	ECFTD104KXL	0.1 25
C306	ECEA1CKS100	10 16
C307	ECQB1H153JZ	0.015 50
C308	ECQB1H153JZ	0.015 50
C309	ECEA1HKR22	0.22 50
C310	ECEA1HKR47	0.47 50
C311	ECEA1HKR22	0.22 50
C312	ECKD1H223PF	0.022 50
C313	ECQP1391JZ	390P 100
C315	ECEA1VK3R3	3.3 35
C316	ECEA1VK3R3	3.3 35
C319	ECEA1VK3R3	3.3 35
C401	ECEA1CKS100	10 16
C402	ECBT1H102KB5	0.001 50
C701	ECKD2H102ZF	0.001 500
C702	ECKD1H103PF	0.01 50
C703	ECKD2H102ZF	0.001 500
C704	ECKD2H102ZF	0.001 500
C705	ECEA1EU102	1000 25
C706	ECEA1CU222	2200 16
C707	ECEA1CU221	220 16
C708	ECEA1VU101	100 35
C709	ECEA1VK100B	10 35
C710	ECKD1H103PF	0.01 50
C711	ECKD1H103PF	0.01 50
C712	ECEA1VK3R3	3.3 35
C713	ECEA1VU101	100 35
C714	ECKD1H103PF	0.01 50
C715	ECKD2H102ZF	0.001 500
C716	ECKD2H102ZF	0.001 500
C717	ECKD2H102ZF	0.001 500
C718	ECKD2H102ZF	0.001 500
C719	ECEA1CKS100	10 16
C720	ECFTD104KXL	0.1 25
C901	ECEA0JU471	470 6.3
C902	ECBT1H102KB5	0.001 50
C903	ECCD1H150KC	15P 50
C904	ECCD1H150KC	15P 50
C905	ECKD1H103PF	0.01 50
C906	ECEA25M4R7R	4.7 25
C907	ECEA1HKR47	0.47 50
C908	ECKD1H103PF	0.01 50
C909	ECKD1H103PF	0.01 50
C910	ECKD1H223PF	0.022 50
C911	ECEA1HKR22	0.22 50
C912	RCBC1H101KBY	100P 50
C913	ECCD1H121K	120P 50
C914	ECKD1H103PF	0.01 50
C915	ECEA0JU222	2200 6.3
C917	ECKD1H103PF	0.01 50
C928	ECBT1H102KB5	0.001 50
C929	ECBT1H102KB5	0.001 50
C951	ECKD1H103PF	0.01 50
C952	ECEA1HK010	1 50

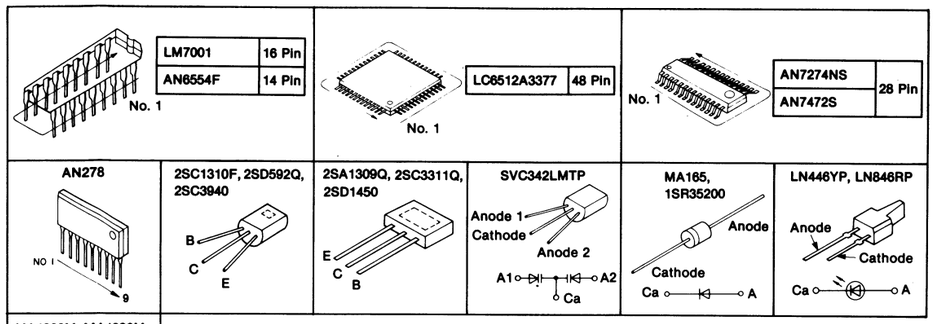
■ REPLACEMENT PARTS LIST

Notes : * Important safety notice :
Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.
* Bracketed indications in Ref. No. columns specify the area. (Refer to the first page for area.)
Parts without these indications can be used for all areas.

Ref. No.	Part No.	Description
INTEGRATED CIRCUITS		
IC101	AN278	I.C
IC102	AN7274NS	I.C
IC301	AN7472S	I.C.
IC302	AN6554F	I.C
IC901	LM7001	I.C
IC902	LC6512A3377	I.C
TRANSISTORS		
Q201	2SA1309A-R	TRANSISTOR
Q251	2SA1309A-R	TRANSISTOR
Q252	2SC3311A-Q	TRANSISTOR
Q253	2SC3311A-Q	TRANSISTOR
Q254	2SC3311A-Q	TRANSISTOR
Q301	2SD1450TTA	TRANSISTOR
Q302	2SD1450TTA	TRANSISTOR
Q303	2SA1309A-R	TRANSISTOR
Q401	2SC3311A-Q	TRANSISTOR
Q402	2SC3311A-Q	TRANSISTOR
Q701	2SC3940AQSTA	TRANSISTOR
Q702	2SD592ANCQ	TRANSISTOR
Q703	2SA1309A-R	TRANSISTOR
Q704	2SA1309A-R	TRANSISTOR
Q901	2SC1310EFG	TRANSISTOR
Q902	2SC1310EFG	TRANSISTOR
Q903	2SA1309A-R	TRANSISTOR
Q904	2SC3311A-Q	TRANSISTOR
Q905	2SC3311A-Q	TRANSISTOR
Q951	2SC3311A-Q	TRANSISTOR
Q952	2SC3311A-Q	TRANSISTOR
DIODES		
D101	MA165	DIODE
D201	SVC342LMTP	DIODE
D202	MA165	DIODE
D203	MA165	DIODE
D204	MA165	DIODE
D301	MA4082M	DIODE
D302	MA165	DIODE
D401	LN846RP	L.E.D
D402	LN446YP	L.E.D
D403	LN446YP	L.E.D
⚠ D701	SVD1SR35200A	RECTIFIER
⚠ D702	SVD1SR35200A	RECTIFIER
D703	MA165	DIODE
D704	MA165	DIODE
D705	MA4140-M	DIODE
D706	MA4062M	DIODE
D707	MA4051-M	DIODE
D901	MA165	DIODE
D903	MA165	DIODE
D904	MA165	DIODE
D906	MA165	DIODE
D907	MA165	DIODE
D908	MA165	DIODE
D909	MA165	DIODE
D910	MA4082M	DIODE
D911	MA165	DIODE
D912	MA165	DIODE
D913	MA165	DIODE
D914	MA165	DIODE
D915	MA165	DIODE
D916	MA165	DIODE
D917	MA165	DIODE
D918	MA165	DIODE
D919	MA165	DIODE
D920	MA165	DIODE
D921	MA165	DIODE
D922	MA165	DIODE
D930	MA4062M	DIODE

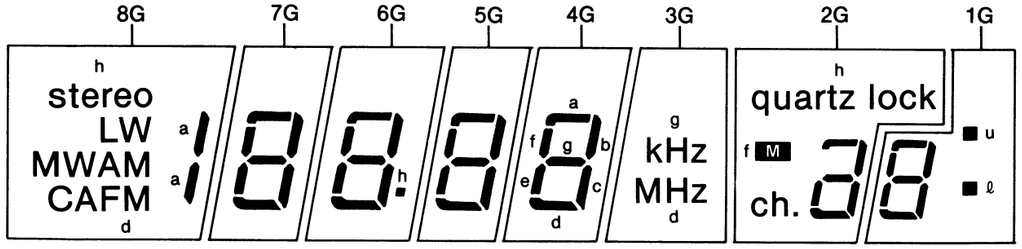
Ref. No.	Part No.	Description
VARIABLE RESISTORS		
VR301	EVND4AA00B15	V.R
VR302	EVND4AA00B14	V.R
VR303	EVND4AA00B55	V.R.
VARIABLE CAPACITORS		
CT201	SVCTZ03T110F	TRIMMER
THERMISTORS AND VARISTORS		
TH101	ERTD2ZHL332S	THERMISTOR
COILS AND TRANSFORMERS		
CT251	SVCTZ03R200F	TRIMMER
L101	RLQZPR47KT-Y	CHOKE COIL
L202	SLA2B3-P	ANTENNA COIL
L203	SL02B9R-P	OSCILLATOR COIL
L251	SLA1B7R-P	ANTENNA COIL
L252	SL01B5-P	OSCILLATOR COIL
L305	RLQZPR47KT-Y	CHOKE COIL
L306	RLQZPR47KT-Y	CHOKE COIL
L307	RLQZP101KT-Y	COIL
L901	RLQZP101KT-Y	COIL
L902	RLQZPR47KT-Y	CHOKE COIL
L903	RLQZP101KT-Y	COIL
T101	SLI4B520-Z	I.F. TRANSFORMER
T102	SLI4B521-Z	I.F. TRANSFORMER
T201	SLI2B104-M	I.F. TRANSFORMER
⚠ T701 (EW, EF, EB)	SLT5K259-K	POWER TRANSFORMER
⚠ T701 (EK)	SLT5K260-K	POWER TRANSFORMER
COMPONENT COMBINATIONS		
Z901	EXBF8E104J	COMBINATION
Z902	EXFP8331MW	COMBINATION
Z903	EXBF9E104J	COMBINATION
FILTERS		
CF101	SVFE107MX2-Q	CERAMIC FILTER
CF102	SVFE107MZ2-Q	CERAMIC FILTER
CF201	SVFSFZ450F7L	CERAMIC FILTER
X901	SVQ49U722-S	CRYSTAL OSCILLATOR
X902	EF0A960K04A	CRYSTAL OSCILLATOR
DISPLAYS		
FL	SAD8MT10ZY1K	DISPLAY TUBE
FRONT PACKS		
FE	SNVFE306E15	FRONT END PACK
FUSES		
⚠ F1	XBA2C04TB0	FUSE , T0.4A250V
SWITCHES		
⚠ S701	SSH1214	SW., POWER.
S901	SSG13	SW, CH1
S902	SSG13	SW, CH2
S903	SSG13	SW, CH3
S904	SSG13	SW, CH4
S905	SSG13	SW, CH5
S906	SSG13	SW, CH6
S907	SSG13	SW, CH7
S908	SSG13	SW, CH8
S909	SSG13	SW, CH9
S910	SSG13	SW, CH0
S913	SSG13	SW, LW
S914	SSG13	SW, DOWN
S915	SSG13	SW, UP
S916	SSG13	SW, MEMORY
S917	SSG13	SW, FM MODE
S918	SSG13	SW, FM
S919	SSG13	SW, MW
RELAYS		
RL201	SFDYG5A237P	RELAY

■ TERMINAL GUIDE OF IC'S, TRANSISTORS AND DIODES



■ DESCRIPTION OF FL PANEL

• GRID ASSIGNMENT

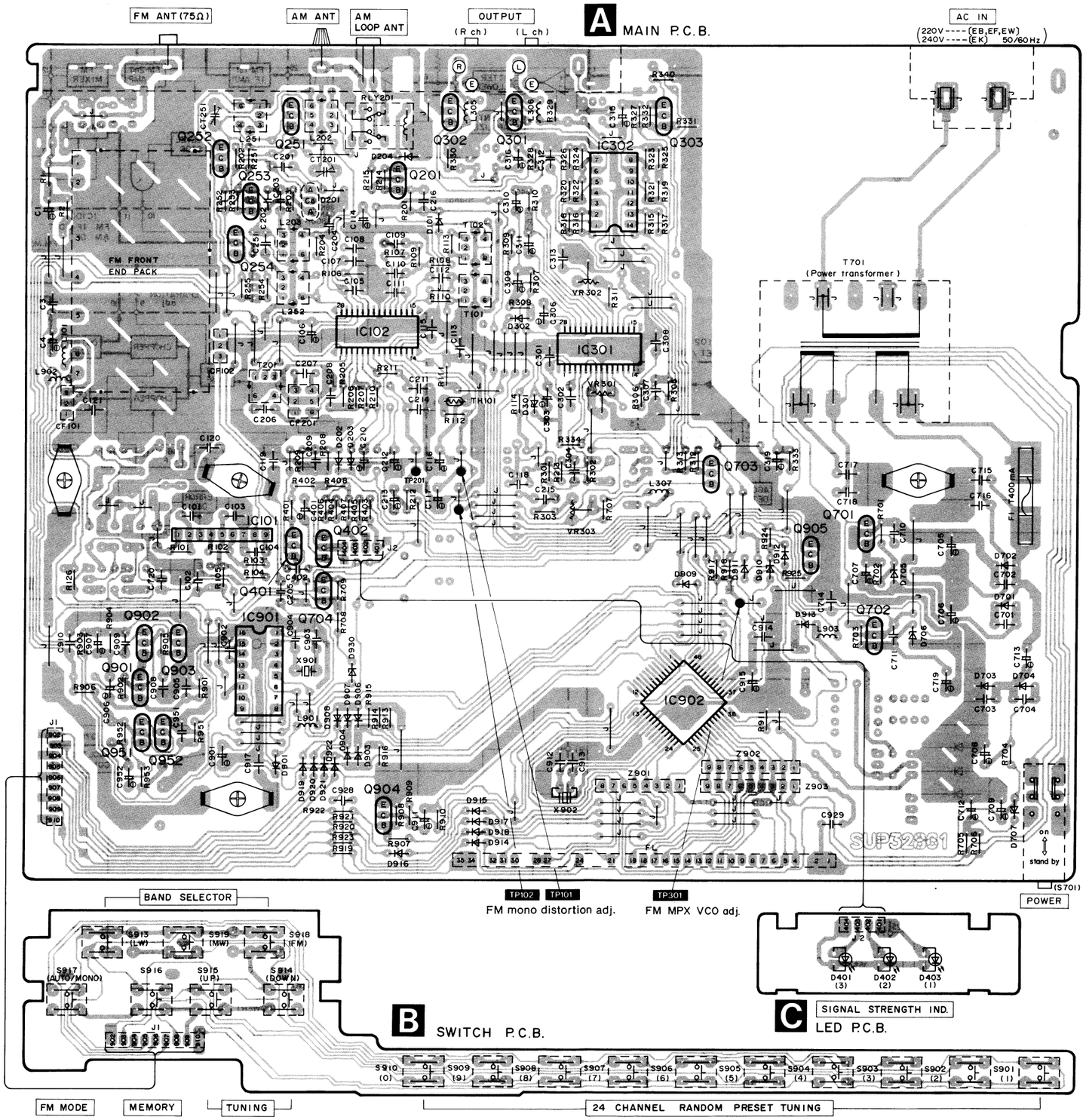


Note: The grid of 3G and 8G are used for external connection.

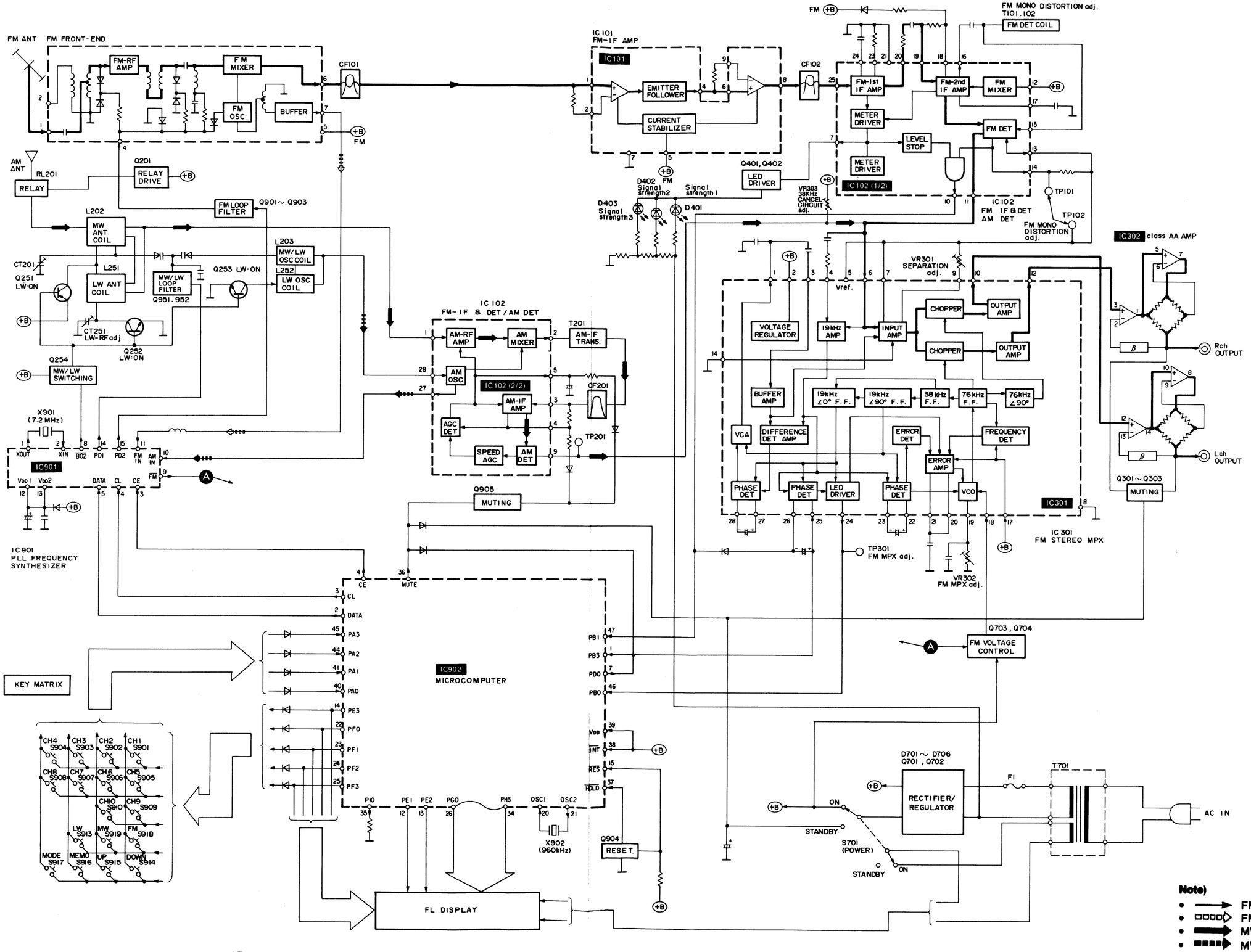
• PIN CONNECTION

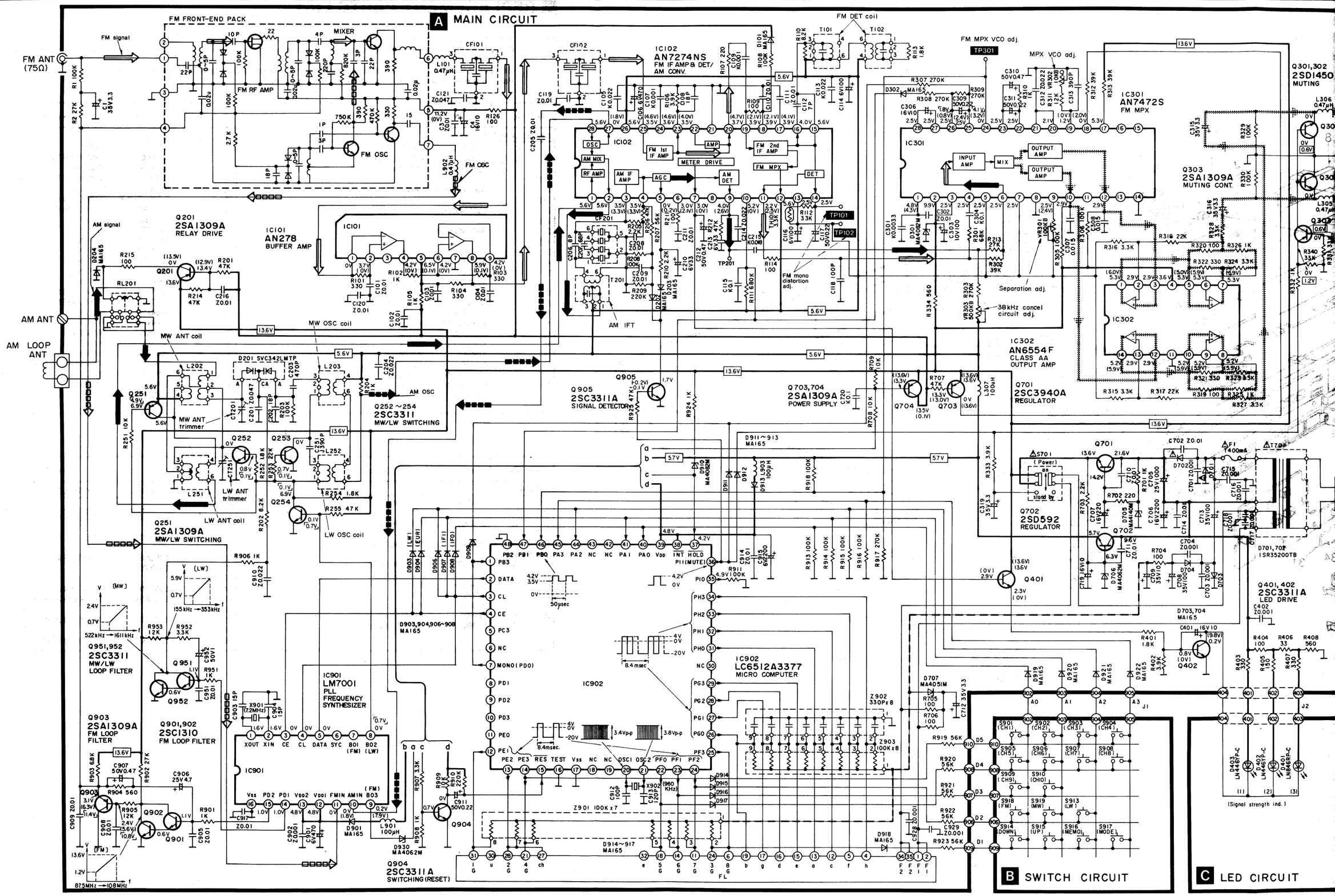
PIN NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
CONNECTION	F1	F1	NP	h	f	8G	AM	MW	CA	LW	7G	c	a	6G	e	d	g	5G
PIN NO.	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	
CONNECTION	b	NP	4G	NP	NP	3G	NP	NP	ch	2G	NP	u	1G	ℓ	NP	F2	F2	

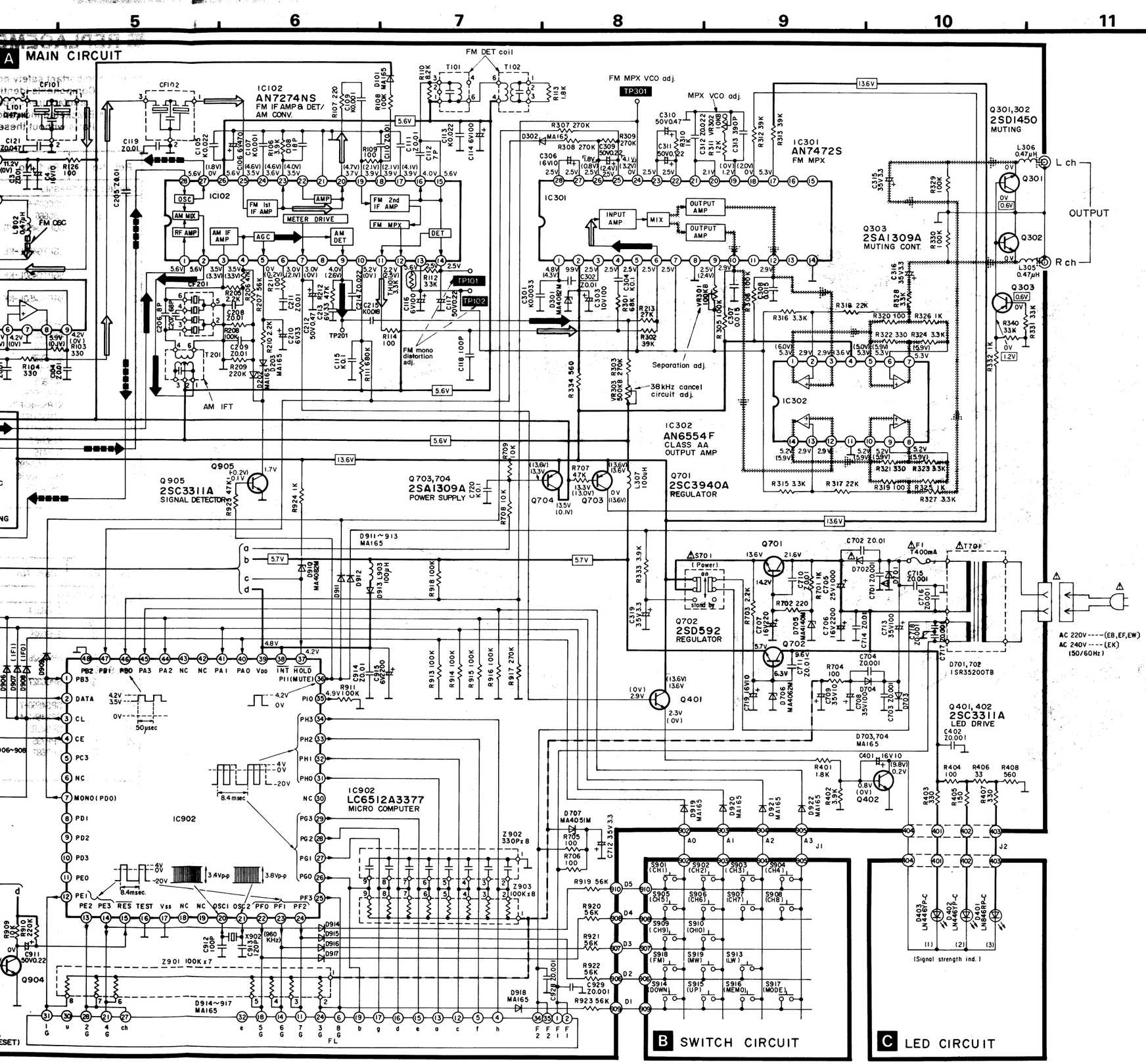
■ CIRCUIT BOARDS AND WIRING CONNECTION DIAGRAM



■ BLOCK DIAGRAM




A MAIN CIRCUIT
FM FRONT-END PACK
FM ANT (75Ω)
FM signal
FM RF AMP
MIXER
FM OSC
CF101
CF102
L101 0.47μH
L902 0.47μH
IC102 AN7274NS FM IF AMP & DET/ AM CONV.
OSC
AM MIX
RF AMP
AM IF AMP
AGC
AM DET
FM 1st IF AMP
AMP
METER DRIVE
FM 2nd IF AMP
FM MPX
DET
AM IFT
FM mono distortion adj.
FM DET coil
T101
T102
FM MPX VCO adj.
MPX VCO adj.
TP301
TP101
TP102
TP201
IC301 AN7472S FM MPX
INPUT AMP
MIX
OUTPUT AMP
Separation adj.
38kHz cancel circuit adj.
IC302 AN6554F CLASS AA OUTPUT AMP
Q301,302 2SD1450 MUTING
Q303 2SA1309A MUTING CONT.
Q201 2SA1309A RELAY DRIVE
RL201
AM signal
AM ANT
AM LOOP ANT
IC101 AN278 BUFFER AMP
MW ANT coil
MW OSC coil
MW ANT trimmer
LW ANT trimmer
LW ANT coil
LW OSC coil
AM OSC
Q251 2SA1309A MW/LW SWITCHING
Q252~254 2SC3311 MW/LW SWITCHING
D201 SVC342LMTP
Q905 2SC3311A SIGNAL DETECTOR
Q703,704 2SA1309A POWER SUPPLY
Q701 2SC3940A REGULATOR
Q702 2SD592 REGULATOR
Q401,402 2SC3311A LED DRIVE
D701,702 ISR35200TB
D703,704 MA165
D707 MA4051M
D911~913 MA165
D914~917 MA165
D918 MA165
D919 MA165
D920 MA165
D921 MA165
D922 MA165
IC901 LM7001 PLL FREQUENCY SYNTHESIZER
IC902 LC6512A3377 MICRO COMPUTER
Q951,952 2SC3311 MW/LW LOOP FILTER
Q903 2SA1309A FM LOOP FILTER
Q901,902 2SC1310 FM LOOP FILTER
Q904 2SC3311A SWITCHING (RESET)
D930 MA4062M
Z901 100K x 7
Z902 330P x 8
Z903 100K x 8
FL
S701 (Power)
stand by
S901 (CH1)
S902 (CH2)
S903 (CH3)
S904 (CH4)
S905 (CH5)
S906 (CH6)
S907 (CH7)
S908 (CH8)
S909 (CH9)
S910 (CH10)
S918 (FM)
S919 (MW)
S913 (LW)
S914 (DOWN)
S915 (UP)
S916 (MEMO)
S917 (MODE)
D403 LN446RP-C
D402 LN446RP-C
D401 LN846RP-C
(Signal strength ind.)
B SWITCH CIRCUIT
C LED CIRCUIT
J1
J2



■SCHEMATIC DIAGRAM

(This schematic diagram may be modified at any time with the development of new technology.)

Note 1:

- **S701** : Power switch in "ON" position.
- **S901～S910** : Preset tuning switch.
  (S901: CH1, S902: CH2, S903: CH3, S904: CH4, S905: CH5, S906: CH6, S907: CH7, S908: CH8, S909: CH9, S910: CH0)
- **S913, S918, S919** : Band selectors.
  S913: LW, S918: FM, S919: MW
- **S914, 915** : Tuning switch.
  S914: down, S915: up
- **S916** : Memory switch.
- **S917** : FM mode selector. (auto↔mono)
- Indicated voltage values are the standard values for the unit measured by the DC electronic circuit tester (high-impedance) with the chassis taken as standard. Therefore, there may exist some errors in the voltage values, depending on the internal impedance of the DC circuit tester.
  All voltage values shown in circuitry are DC voltage in FM signal (no signal) reception modes.
  * Figures in ( ) stand for DC voltage in AM signal reception mode.
  * Figures in ⌜ ⌟ stand for DC voltage in LW signal reception mode.
  * Figures in ▭ stand for muting mode.

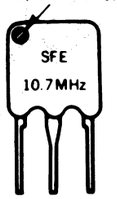
  Positive voltage lines — AF signal lines
  FM OSC — FM signal
  AM OSC — AM (MW/LW) signal
- Important safety notice.
  Components identified by ⚠ mark have special characteristics important for safety.
  When replacing any of these components, use only manufacturer's specified parts.

Note 2:

- **Use of ceramic filters in pairs**

The ceramic filters (CF101, CF102) for FM-IF circuit are available in three versions. For this circuit, be sure to use the ceramics of the same version in a pair.
At repairing and replacement, pay close attention to the diodes (**D907, D908**) for use as different diodes must be used depending on each version of the ceramic filters.

Color marking
(Red, Black or White)



VERSION (Color)	D907	D908	CENTER FREQUENCY
Black	×	○	10.65MHz
Red	×	×	10.70MHz
White	○	×	10.75MHz

Note: ○ mark: Diode is used.
× mark: Diode is not used.

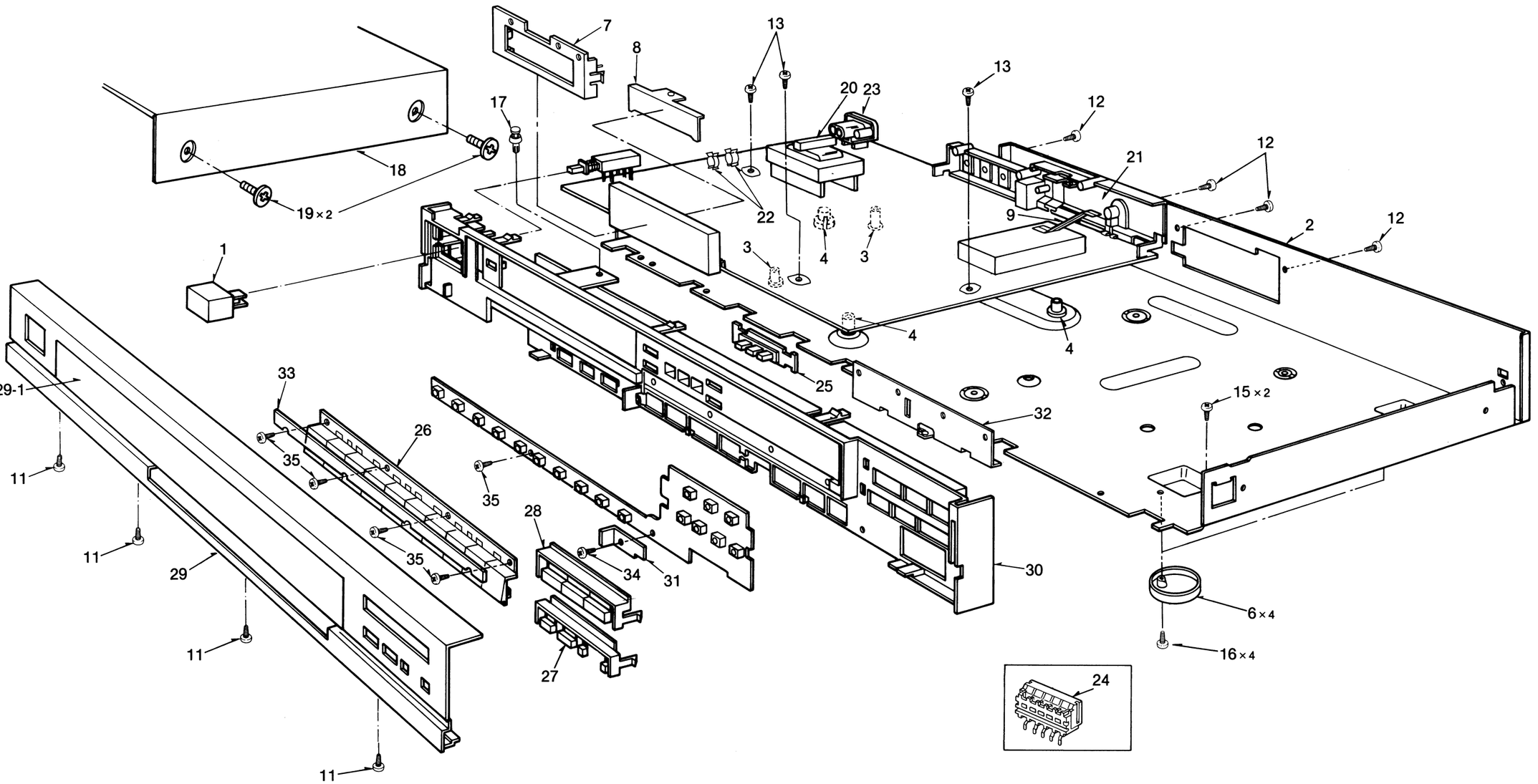
* Caution!

IC and LSI are sensitive to static electricity.
Secondary trouble can be prevented by taking care during repair.

- Cover the parts boxes made of plastics with aluminum foil.
- Ground the soldering iron.
- Put a conductive mat on the work table.
- Do not touch the legs of IC or LSI with the fingers directly.

ST-G450L ST-G450L

■ EXPLODED VIEW

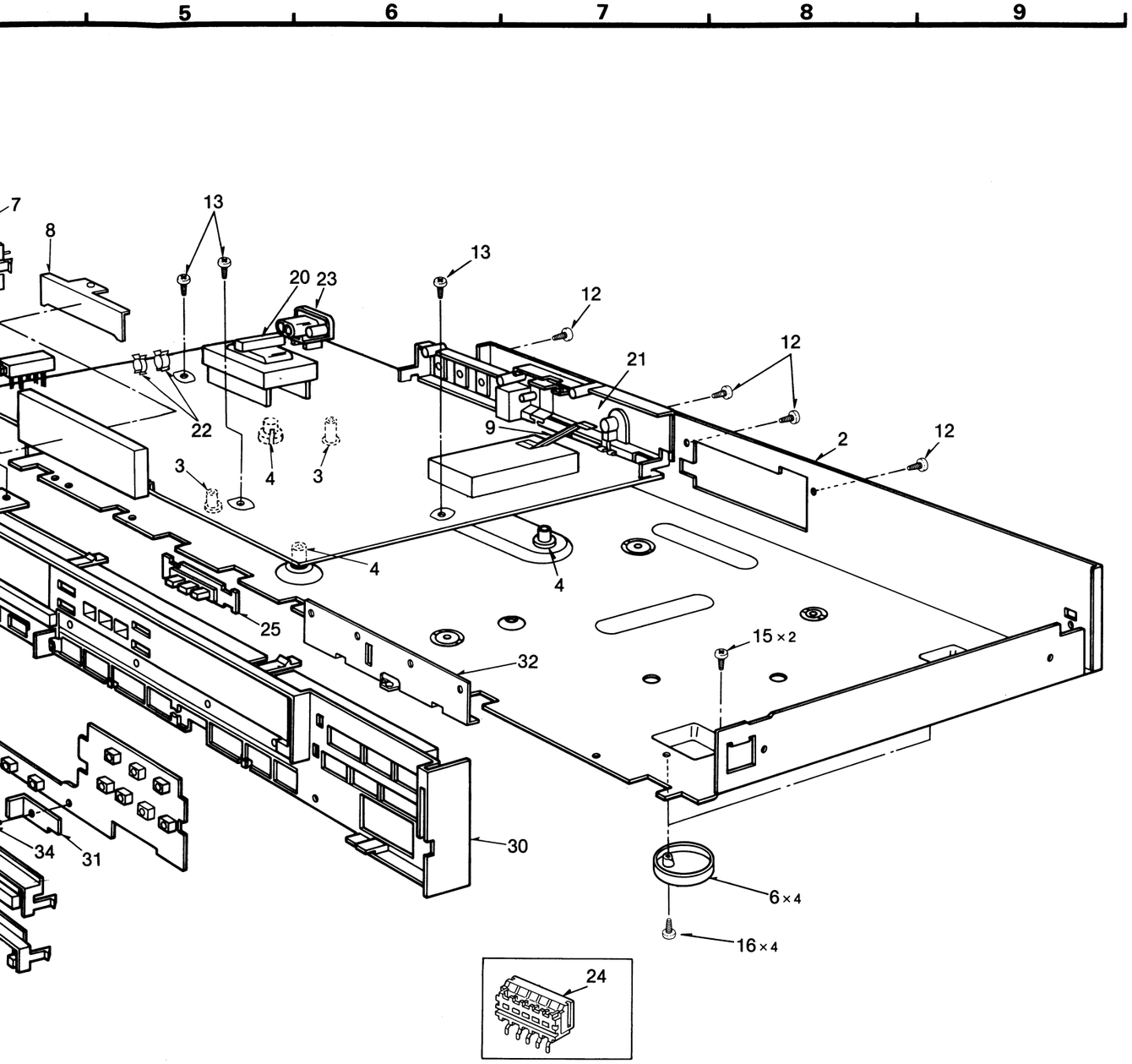


■ REPLACE

Notes : * Important safe
Components id
manufacturer'
* Bracketed indi
Parts without t

Ref. No.		Part No
CABINET AND CHASSIS		
1	Ⓚ	SBC666-5
1	Ⓢ	SBC666
2 (EB)		SGPTG450
2 (EW)		SGPTG450
2 (EF)		SGPTG450
2 (EK)		SGPTG450
3		SHE181
4		SHE185-1
6		SKL316
7		SGX7988
8		SUW3119
9		SUS803
11		XTB3+6FF
12		XTBS3+6J
13		XTBS3+16F
15		XTW3+8TF
16		XTW3+8T
17		SHR415
18	Ⓚ	SKC1710K9
18	Ⓢ	SKC1710S9
19		SHG1613-1

Ref. No.		Part No
PACKING MATERIAL		
P1 (EW, EK, EB)	Ⓚ	SPG6324
P1 (EF)	Ⓚ	SPG6325
P1 (EW, EK, EB)	Ⓢ	SPG6326
P1 (EF)	Ⓢ	SPG6327
P2		SPS4550-7
P3		SPS4551-4
P4		SPS4552
P6	Ⓚ	SPP735
P6	Ⓢ	SPP697



■ REPLACEMENT PARTS LIST

Notes : * Important safety notice :
Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.
* Bracketed indications in Ref. No. columns specify the area. (Refer to the first page for area.)
Parts without these indications can be used for all areas.

Ref. No.		Part No.	Description
CABINET AND CHASSIS			
1	Ⓚ	SBC666-5	BUTTON
1	Ⓢ	SBC666	BUTTON, POWER
2 (EB)		SGPTG450L-KB	REAR PANEL
2 (EW)		SGPTG450L-KE	PANEL
2 (EF)		SGPTG450L-KF	REAR PANEL
2 (EK)		SGPTG450L-KK	REAR PANEL
3		SHE181	HOLDER
4		SHE185-1	SPACER
6		SKL316	FOOT
7		SGX7988	ORNAMENT
8		SUW3119	BRACKET
9		SUS803	COIL SPRING
11		XTB3+6FFZ	SCREW
12		XTBS3+8JFZ1	SCREW
13		XTBS3+16F1	SCREW
15		XTW3+8TFR	SCREW
16		XTW3+8T	SCREW
17		SHR415	LOCK PIN
18	Ⓚ	SKC1710K99	CABINET
18	Ⓢ	SKC1710S98	CABINET
19		SHG1613-1	RUBBER PARTS
19	Ⓚ	SNE2129-1	SCREW
19	Ⓢ	SNE2129	SCREW
20		SHG1639	RUBBER PARTS
21		SJF8513N	TERMINAL
22		SJT390	FUSE HOLDER
23	⚠	SJS9236	AC INLET
24		SJT30440LX-V	CONNECTOR(4P)
24		SJT30940LX-V	CONNECTOR(9P)
25		SHR5350	HOLDER
26	Ⓚ	SBC726D	BUTTON
26	Ⓢ	SBC726-1D	BUTTON
27	Ⓚ	SBC810-4	BUTTON
27	Ⓢ	SBC810-5	BUTTON
28	Ⓚ	SBC812A	BUTTON
28	Ⓢ	SBC812-1A	BUTTON
29	Ⓚ	SGWTG450L-KE	FRONT PANEL ASSY
29	Ⓢ	SGWTG450L-SE	FRONT PANEL ASSY
29-1	Ⓚ	SGU497-8	FILTER
29-1	Ⓢ	SGU497-9	FILTER
30	Ⓚ	SGX7830	ORNAMENT
30	Ⓢ	SGX7830-1	ORNAMENT
31	Ⓚ	SGX7733	ORNAMENT
31	Ⓢ	SGX7733-1	ORNAMENT
32		SUW3002	BRACKET
33		SUW3011	BRACKET
34		XTB3+10G	SCREW
35		XTB3+12JFZ	SCREW

Ref. No.		Part No.	Description
PACKING MATERIAL			
P1 (EW, EK, EB)	Ⓚ	SPG6324	PACKING CASE
P1 (EF)	Ⓚ	SPG6325	PACKING CASE
P1 (EW, EK, EB)	Ⓢ	SPG6326	PACKING CASE
P1 (EF)	Ⓢ	SPG6327	PACKING CASE
P2		SPS4550-7	PAD
P3		SPS4551-4	PAD
P4		SPS4552	PAD
P6	Ⓚ	SPP735	PROTECTION COVER
P6	Ⓢ	SPP697	PROTECTION BAG
P7		XZB24X40C04	POLYETHYLENE COVER
ACCESSORIES			
A1 (EW, EF, EB)	⚠	SFDAC05E03	POWER CORD
A1 (EK)	⚠	SFDAC05G02	POWER CORD
A2		SJP2249-1	OUTPUT CORD
A3 (EK)	⚠	SJP9009	PLUG
A4		SSA270M	FM ANTENNA
A5 (EW, EB)		SQF13258	INSTRUCTION BOOK
A5 (EK, EF)		SQF13261	INSTRUCTION BOOK
A6		SPB1162T	AM LOOP ANTENNA

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